

APPENDIX IV

TAB S

DOVER AREA SCHOOL DISTRICT

BIOLOGY 1 PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life.

GRADE(S): 9

COURSE LENGTH: 90 days DURATION: 90 min. pds. FREQUENCY: 6 out of 6

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES		MATERIALS AND RESOURCES
			INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES	
8 Days	<u>Chapter One- The Science of Biology</u>				
3 days	Students will be able to list and define the characteristics of life.	3.3.10.A	Lecture Labs Teacher demonstration Student discussion	Biology: The Living Science Textbook Living/Nonliving collage	
2 days	Students will be able to list, define, and give examples of the levels of organization in biology from atoms to biosphere.	3.3.10.A	Student activity Student discussion	Levels of Organization WS Pyramid activity	
3 days	Students will be able to use a microscope properly. Students will differentiate between the scanning electron, transmission electron, compound light, and stereomicroscopes.	3.7.10.A 3.7.10.B	Lab Lecture Demonstration Homework	Textbook Microscope Lab Microscope handout Microscope drawing guide	

EXHIBIT B

DOVER AREA SCHOOL DISTRICT

BIOLOGY CHAPTER 1 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Mathematical conversions Artistic expression Problem solving techniques	Research history of microscopes Expand on science project Research biologists that study the different levels of organization Lab report	Model steps as you teach One-on-one instruction Provide visual help Allow more time to work	Unit One Exam Laboratory activities Quizzes Homework

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9

COURSE LENGTH: 90 days

DURATION: 90 minutes FREQUENCY: 6 out of 6

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
11 days	<u>Chapter 2 - The Chemistry of Life</u>	3.3.10.B	Lab Lecture Homework	Textbook Periodic tables Water lab
1 day	Students will be able to differentiate between organic and inorganic molecules. Students will be able to experiment with and define the properties of water.	3.3.10.B	Lecture Lab	Acid/Base Lab
1 day	Students will be able to identify acids and bases by their pH values.	3.3.10.B 9.3.9.E	Lecture Student activity	Pasta Power packet Carbohydrate activity
3 days	Students will be able to build	3.3.10.B	Lab	Pasta Power packet

structural models for all types of carbohydrates.	Students will be able to perform qualitative tests on foods.	Students will be able to identify the characteristics of lipids and the functions of lipids in the body.	Students will be able to calculate percentage of body fat using the skin calipers.	Students will be able to qualitatively test for lipids.	Students will be able to identify the characteristics of proteins and their functions within the human body.	Students will be able to qualitatively test food products for the presence of specific organic compounds.	1 day
Molecular Model Lab	Carbohydrate lab Pasta Power packet	Cholesterol video Lipid activity	Percent body fat calculation Lipid lab	Protein activity	Biochemistry Lab Lab write up		
Student activity	Lab	Lecture Student activity and practice	Student activity Lab	Lecture Student activity	Lab		
	3.3.10.B 9.3.9.E	3.3.10.B 9.3.9.D	3.3.10.B 9.3.9.D	3.3.10.B		3.3.10.B	

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTER 2 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Family and Consumer Sciences Nutritional and dietary planning Writing	Plan a weekly diet incorporating each organic compound. Build models of each of the compounds.	Outline to support comprehension Help students with vocabulary terms Break down information into shorter tests	Chapter 2 Exam Lab activities Lab write-up Pasta Power writing activity Homework assignments

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 COURSE LENGTH: 90 days DURATION: 90 minutes FREQUENCY: 6 out of 6

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES		MATERIALS AND RESOURCES
			Lecture	Demonstration	
8 days	Chapter 3 – Cell structure and function	3.3.10.A 3.3.10.B			Textbook Computer Cell pictures
1 day	The student will be able to differentiate between a eukaryotic and a prokaryotic cell. The student will be able to explain how the cell shape relates to its function. The student will be able to differentiate between a plant and an animal cell.				
3 days	The student will be able to diagram a typical animal or plant cell and explain the functions of the organelles.	3.3.10.A 3.3.10.B	Student project		Textbook Internet Power point presentation Cell project outline Computer lab
2 days	The students will be able to identify the parts of a cell under the microscope.	3.3.10.A 3.3.10.B	Lab		Cell lab Microscopes

1 day	<p>The students will be able to differentiate between passive and active transport, diffusion and osmosis, and hypertonic, hypotonic, and isotonic.</p> <p>The student will be able to determine the rate of osmosis using dialysis tubing.</p>	3.3.10.A 3.3.10.B	Lecture Demonstration Student activity	Hypertonic, hypotonic, and isotonic worksheet	Rate of osmosis lab
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DOVER AREA SCHOOL DISTRICT

BIOLOGY I - CHAPTER 3 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Physics – lenses Medicine	Describe how osmosis affects living things (i.e. penicillin).	Read tests Group study sessions Help student with vocabulary terms	Chapter 3 Exam Cell Project Lab activities

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9

COURSE LENGTH: 90 days

DURATION: 90 minutes

FREQUENCY: 6 out of 6

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES		MATERIALS AND RESOURCES
8 days	<u>Chapter 4 – Energy and the Cell</u>			Lecture Demonstration	Textbook Lime water demonstration
1 day		3.3.10.B	The students will be able to explain how energy is stored in ATP. To list how energy is converted from one form to another.		
2 days		3.3.10.B	The student will be able to describe the structure of ATP and how it is used by the body for the energy.	Student activity	ATP advertisement activity
1 day	The student will be able to	3.3.10.B			Lab
					Fermentation Lab

<p>demonstrate fermentation and to determine the reactants and products.</p> <p>The student will be able to describe the overall reaction of cellular respiration.</p> <p>1 day</p>	<p>3.3.10.B</p> <p>The student will be able to describe the light and dark reactions of photosynthesis.</p> <p>The student will be able to describe the function of chlorophyll.</p> <p>1 day</p>	<p>Student activity</p> <p>Lecture Demonstration</p> <p>3.3.10.B</p> <p>The student will be able to identify the pigments found in leaves and the function of those pigments.</p> <p>1 day</p>	<p>Diagram cellular respiration</p> <p>Textbook</p> <p>Separation of Leaf Pigments Lab</p> <p>Lab</p>
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DOVER AREA SCHOOL DISTRICT

BIOLOGY I - CHAPTER 4 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Physics Industrial uses of fermentation Mathematical equations Chemistry Aerobic and anaerobic exercises	Report on industrial uses of fermentation Muscles and ATP Define aerobic and anaerobic exercises Explain the function of other pigments in plants ex. Flower petals	Highlight important reactions Break down reactions into small steps Small group study sessions	Chapter 4 Exam ATP advertisements Lab activities Cellular respiration posters

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 COURSE LENGTH: 90 days

WRITTEN BY:

DURATION: 90 minutes FREQUENCY: 6 out of 6

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
7 days	Chapter 5 - Cell Division Chapter 6 - Genetics	3.3.10.C.1 3.3.10.C.3	Lecture Filmstrip Demonstration	Dukane filmstrip Overhead projector Colored pencils Mitosis/Meiosis packet
1 day	Students will be able to differentiate between asexual and sexual reproduction. Students will be able to list reasons a cell would undergo mitosis.	3.3.10.C.1	Lab	Microscope Onion root tip slides Fish blastula slides Colored pencils TV projection microscope
2 days	Students will be able to identify stages of mitosis under the microscope.	3.3.10.C.1		Bead kit
1 day	Students will be able to	3.3.10.C.1	Lab	

<p>1 day</p> <p>Students will be able to describe what occurs in each stage of mitosis. Students will be able to list reasons for undergoing meiosis and compare it to mitosis. Students will be able to define tetrad, homologous chromosomes, diploid, haploid, gametes, zygote.</p>	<p>3.3.10.C.1</p> <p>Quiz Lecture</p>	<p>Student activity</p> <p>Mitosis Quiz Mitosis/Meiosis packet Meiosis Overhead Overhead projector</p>
<p>1 day</p> <p>Students will be able to draw the stages of meiosis to demonstrate what occurs in each stage.</p>	<p>3.3.10.C.3</p> <p>Student activity</p>	<p>Mitosis/Meiosis packet Colored pencils</p>
<p>1 day</p> <p>Students will be able to diagnose a chromosomal abnormality using a karyotype.</p>	<p>3.3.12.C.4</p> <p>Student activity/lab</p>	<p>Karyotype lab</p>

DOVER AREA SCHOOL DISTRICT

BIOLOGYI -CHAPTERS 5 & 6 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Math Art Health	Research and report on how mitosis is related to cancer. Interview a genetic counselor to learn the problems that can occur with meiosis and aging. Differentiate between males and females undergoing meiosis.	Outline to support comprehension Help students with vocabulary terms Break down information into shorter tests	Mitosis Quiz Meiosis Quiz Lab reports Mitosis/Meiosis Exam Cancer research paper

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9

COURSE LENGTH: 90 days

WRITTEN BY:

DURATION: 90 minutes

FREQUENCY: 6 out of 6

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
12 days	Chapter 6 – Genetics Chapter 7 – Human Inheritance	3.3.10.C.4	Lecture Student activity	Mendel worksheet
1 day	Students will be able to describe Mendel's study on pea plants. Students will be able to define homozygous, heterozygous, dominant, and recessive, phenotype, and genotype, and generation names.	3.3.10.C.6	Lab	Human Genetics Lab Investigating Human Traits Lab Coins
1 day	Students will be able to investigate some human traits that are inherited by simple dominant and recessive alleles.	3.3.10.C.2	Research	Library

1 day	<p>research a genetic disease.</p> <p>Students will be able to cross two monohybrid traits and describe the resulting offspring.</p> <p>Students will be able to cross variations of two traits and predict the results.</p> <p>Students will be able to cross variations of a codominant trait and predict the results.</p> <p>Students will be able to cross variations of a sex-linked trait and predict the results.</p> <p>Students will be able to cross variations of a multiple allele problem and predict the results. Students will be able to determine the paternity of a baby using knowledge of bloodtyping genetics.</p> <p>Students will be able to describe the results of multiple gene and pedigree problems.</p>	<p>3.3.10.C.6</p> <p>3.3.10.C.6</p> <p>3.3.10.C.6</p> <p>3.3.10.C.6</p> <p>3.3.10.C.6</p> <p>3.3.10.C.6</p>	<p>Lecture Student practice</p> <p>Lecture Student practice Lab</p> <p>Lecture Student practice</p> <p>Lecture Student practice</p> <p>Lecture Student practice</p> <p>Lecture Student practice</p>	<p>Monohybrid problems</p> <p>Dihybrid problems Corn dihybrid lab Investigation of Dihybrid Crossing</p> <p>Codominant problems</p> <p>Sex-linked problems</p> <p>Bloodtyping problems Paternity Test Lab</p> <p>Pedigree problems Multiple gene problems</p>	<p>Internet Research activity</p>
1 day	<p>Students will be able to</p>	<p>3.3.10.D.4</p>	<p>Video and discussion</p>		<p>Secret of Life video</p>

<p>collection TV/VCR Video questionnaire</p> <p>Secret of Life video collection TV/VCR Video questionnaire</p> <p>Genetic disorder reports grade sheets</p>	<p>Video and discussion</p> <p>Student oral reports</p>	<p>3.3.10.D.4</p> <p>3.3.10.C.2</p>	<p>Students will be able to discuss the ramifications of using DNA to design their own children and cloning.</p> <p>Students will be able to describe several genetic disorders.</p>
<p>1 day</p> <p>1 day</p>			

DOVER AREA SCHOOL DISTRICT

BIOLOGY I – CHAPTERS 6 & 7 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Health Family and Consumer Sciences Mathematics	Fruit fly cross Pedigree analysis of family	Allow more time for tests Break down problems into steps Individual instruction Study guides After school tutoring	Monohybrid Quiz Dihybrid Quiz Codominant Quiz Sex-linked Quiz Bloodtyping Quiz Multiple Gene Quiz Genetics Exam Lab write-ups

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED COURSE/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9

COURSE LENGTH: 90 days

DURATION: 90 minutes

FREQUENCY: 6 out of 6

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
9 days	Chapter 8 - DNA and RNA Chapter 9 – Genetic Engineering	3.3.10.C.5	Lecture Student activity	DNA packet DNA kits
1 day	Students will be able to describe the structure of DNA, where its found, and its function.	3.3.10.C.5	Student activity	DNA kits Colored pencils
1 day	Students will be able to construct a DNA model, drawing and labeling all parts.	3.3.10.C.5	Video and discussion	Murder, Rape, and DNA video Video questionnaire
1 day	Students will be able to discuss the applications of using DNA in criminal trials.	3.3.10.C.7	Lecture	DNA packet
1 day	Students will be able to			

<p>describe the steps of transcription and diagram those steps.</p> <p>Students will be able to describe the steps of translation and diagram those steps.</p>	<p>3.3.10.C.7</p> <p>Students will be able to synthesize the information on protein synthesis using models and a strand of DNA to code for traits on a make believe animal.</p>	<p>Lecture</p> <p>Student activity</p> <p>3.3.10.C.7</p> <p>Students will be able to define and describe types of chromosomal and gene mutations.</p>	<p>Student activity</p> <p>Lecture</p> <p>Student activity</p> <p>3.3.10.C.2</p> <p>Students will be able to describe how scientists manipulate DNA to insert certain genes.</p>	<p>DNA kits Colored pencils</p> <p>DNA packet DNA kits Colored pencils</p> <p>DNA packet DNA kits Protein synthesis lab</p> <p>Textbook Colored pencils</p> <p>Lecture</p> <p>Students activity</p> <p>3.3.12.C.3</p> <p>Students will be able to discuss the real world implications of genetic recombination.</p> <p>Genetic Manipulation Lab</p> <p>Video and discussion Readings</p> <p>The Mouse that Laid the Golden Egg video "Your World" magazines</p>

DOVER AREA SCHOOL DISTRICT

BIOLOGY I- CHAPTERS 8 & 9 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Art Health	Human Genome Project report DNA fingerprinting and electrophoresis	Study guides Tests read to students More time to take test DNA manipulatives	DNA Exam DNA Performance Exam Lab write-ups

DOVER AREA SCHOOL DISTRICT

BIOLOGY I PLANNED INSTRUCTION/CURRICULUM GUIDE

PART A

COURSE DESCRIPTION: The study of life

GRADE(S): 9 COURSE LENGTH: 90 days

WRITTEN BY:

TIME (WEEKS/CLASSES)	UNIT CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
19 days	<u>Chapter 10 – Natural Selection</u> <u>Chapter 11 – The Mechanism of Evolution</u> <u>Chapter 12 – The Origins of Biodiversity</u>			
1 day	Students will be able to discuss Darwin's observations of the living world. Students will be able to discuss the variability found in nature.	3.3.10.D.6	Lecture Mini Lab	Textbook Graph paper
2 days	Students will be able to describe biomes and list the adaptations that organisms have to survive in this environment.	3.3.10.D.6	Research Student reports	Textbook Library Internet Art supplies
1 day	Students will be able to determine how limiting factors work to limit population sizes.	3.3.10.D.6	Lecture Student activity	Green peppers Worksheets Textbook
1 day	Students will be able to define types of competition and how they relate to population size.	3.3.10.D.1	Lecture Video	TV/VCR Video questionnaire
1 day	Students will be able to list evidences used to support Darwin's theory of the Origins of Species.	3.3.10.D.1	Lecture Lab	Evolution Worksheet Biochemical Evidence Lab
1 day	Students will be made aware of gaps/problems in Darwin's Theory and of other theories of evolution including, but not limited to Intelligent Design.	3.3.10.D.1	Lecture	Reference: <u>Of Pandas and People</u>

Note: The Origins of Life is not taught.

TIME (WEEKS/CLASSES)	CONTENT/CONCEPTS/ PROCESS	STATE STANDARD (NAT. STANDARD)	INSTRUCTIONAL STRATEGIES, LEARNING PRACTICES ACTIVITIES AND EXPERIENCES	MATERIALS AND RESOURCES
3 days	Students will be able to make a time line that demonstrates evolutionary changes during the history of earth.	3.3.10.D.5	Lab	Textbook Simulating Natural Selection Lab
1 day	Students will be able to design a species placed under climatic pressure.	3.3.10.D.6	Lab Lecture	Textbook Simulating Natural Selection Lab
1 day	Students will be able to differentiate between disruptive, directional and stabilizing selection.	3.3.10.D.6	Lecture Student Activity	Darwin meets DNA activity Textbook
1 day	Students will be able to graph the types of selection using human height	3.3.10.D.6	Lecture Student Activity	Darwin meets DNA activity Textbook
1 day	Students will be able to describe how speciation takes place using Darwin's finches as an example.	3.3.10.D.6	Lecture Lab	Graph paper Colored pencils Pliers lab
1 day	Students will be able to list how species change due to reproductive isolation.	3.3.10.D.6	Video and Discussion	Voyage to the Galapagos Video Video questionnaire
1 day	Students will be able to differentiate between adaptive radiation and convergent evolution.	3.3.10.D.6	Lecture Student Activity	Textbook Backyard evolution activity
3 days	Students will be able to discuss the importance of biodiversity and list reasons why organisms have become extinct.	3.3.10.D.3	Lecture Student Research and Activity	Endangered species trading cards

DOVER AREA SCHOOL DISTRICT

BIOLOGY I - CHAPTERS 10, 11, 12 PLANNED COURSE/CURRICULUM GUIDE

PART B

GRADE: 9

OPPORTUNITIES FOR INTEGRATION	ENRICHMENT, AND EXPANDED OPPORTUNITIES	REMEDIATION AND INTERVENTION STRATEGIES	ASSESSMENTS AND PORTFOLIO OPPORTUNITIES
Earth Science Math Writing	Research dinosaur extinction Create a phylogenetic tree on any species Fossil studies of Pennsylvania	Study guides Extra time on tests One-on-one instruction	Evolution Exam Lab write-ups Projects